



Casting Screen Using Raspberry pi

D. Kathir Eswaran¹, R. Vinu Kumar², S. Bavadharani³

¹Electrical and Electronics Engineering, Dr.Mahalingam College of Engineering and Technology

²Electrical and Electronics Engineering, Dr.Mahalingam College of Engineering and Technology

³Electrical and Electronics Engineering, Dr.Mahalingam College of Engineering and Technology

Abstract — Projection technology plays vital role in school, colleges and conferences. Representing any thought visually makes more impressive than representing it orally. So use of projector is most important in our day to day life. Nowadays different projectors are available. But they are costly to purchase also if we have old projector with us, then it is expensive to purchase another one. So this project explains that how to make projector as an intelligent projector. In this project we use raspberry pi and its interface connection to connect it with the projector. Also when we want to show presentation we have to connect our laptop to the projector. Projector and laptop has different inputs so there is problem arise. So in this project the solution can be given. The Raspberry Pi can be used here to solve the problem of cables. Also it replace laptop so the cost is reduced. This paper gives idea to remotely cast the data from laptop. To operate it remotely we use Virtual Network Computing System (VNC).

Keywords- Projection; Projector; Raspberry pi; Virtual network Computing(VNC);

I. INTRODUCTION

Wireless communication, or sometimes simply wireless, is the transfer of information or power between two or more points that are not connected by an electrical conductor. Screencasts have become a regular fixture in distance education programs because they provide a sense of engagement between faculty and students without compromising the ability to access learning materials online whenever and wherever it is convenient. In other cases, faculty have taken advantage of screencasts to provide learning resources to local students. For some students, the technology allows them to learn in a more self-directed fashion, one that suits their style and speed of learning.

II. HARDWARE DESCRIPTION

In this study, The Raspberry Pi which is a creditcard-sized single board computer developed in UK is used which is a microprocessor by nature. One laptop having Windows 7 operating system were used to apply tests about transmitting videos, pictures and audio files from laptop to PI which is connected to the projector via USB Wi-Fi adapter as there is no internal Wi-Fi module in Pi.

A. RASPBERRY PI

Raspberry Pi in details The Raspberry Pi has a Broadcom BCM2835 system on a chip (SoC), which includes an ARM1176JZFS 700 MHz processor, Video Core IV GPU, and was originally shipped with 256 megabytes of RAM, later upgraded to 512 MB. It does not include a builtin hard disk or solid-state drive, but uses an SD card for booting and persistent storage. Model B has two USB ports and a 10/100 Ethernet controller. On the model B the Ethernet port is provided by a builtin USB Ethernet adapter. As typical modern computers, generic Figure 1 Raspberry Pi Single Board Computer USB keyboards and mouse are compatible with Raspberry Pi. The Raspberry Pi does not come with a real-time clock, so an OS must use a network time server, or ask the user for time information at boot time to get access to time and date for file time and date stamping. In order to install an operating system, platform has a micro SD connector to use micro SD cards as well.



Figure 1. Raspberry pi[2]

B. LAPTOP

Laptops with Windows Operating System Laptop having a speed of 2.4 GHz i5 processor and capacity of 4 GB RAM is used for Window 7 based system.

C. WIFI ADAPTER

USB Wi-Fi adapter Wireless N USB Adapter TL-WN727N[3] allows you to connect a desktop or notebook computer to a wireless network and access high-speed Internet connection. Comply with IEEE 802.11n, they provide wireless speed up to 150Mbps. Supports 64/128 WEP, WPA /WPA2/WPA-PSK/WPA2- PSK(TKIP/AES), supports IEEE 802.1X. Supports Windows 8 32/64bits, Windows 7 32/64bits, Windows XP 32/64bits. Supports ad-hoc and infrastructure mode.

D. RCA CABLES

Cables An RCA cable is used in connecting Raspberry Pi and projector. Pi has RCA out and audio out, from where the video and audio can be streamed on the screen from projector.

III. SYSTEM DESIGN

An Operating System named Raspbmc is installed in the SD card of suitable size (8GB) before which the SD card is formatted using SD formatterv4 tool. This tool leaves no cache files in the SD card. The SD card must not have any files during the installation of OS. This OS is installed as per our requirements for the project. We are interested in projecting videos, to play audio files and project images on the screen as well project a presentation file which can be converted to .wmv file using MS Office 2010 which gives the user an option to convert a ppt files to wmv format.

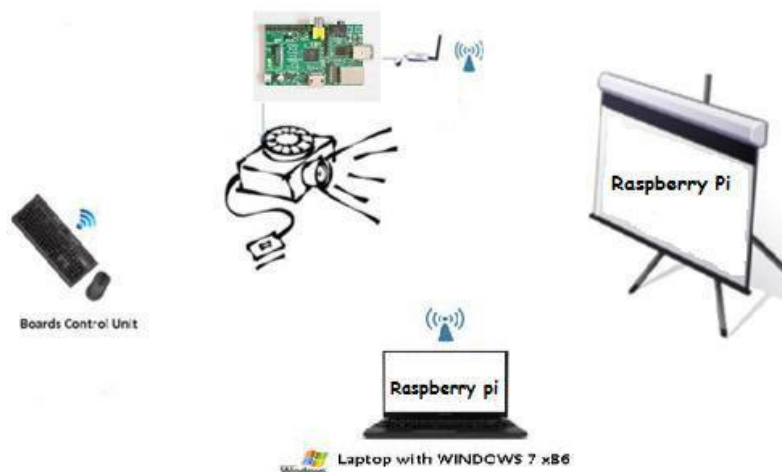


Figure 2. System Design Block Diagram

This problem arises as 'bmc' OS does not support ppt format files, so we can convert the ppt file to wmv format and play it like a video and project the same on the screen. We are using a tool named 'Connectify Me' to connect laptop and Raspberry Pi which creates a hotspot, which is nothing but a network to connect different devices. The Raspberry Pi is connected to laptop via TP-Link adapter through Connectify-Me which has created a Wi-Fi hotspot. A network is created in Connectify-Me. Both the USB adapter and android mobile are connected to the network. Or a wireless local LAN can be used for getting connected to the network. Wi-Fi adapter, Laptop and Android mobile are connected to the wireless Local network if not connected by connectify-me application. Then an application called VNC viewer is installed in the Raspberry pi. At the same time a application called VNC Server is installed in the laptop or mobile phone.

IV. IMPLEMENTATION

Raspberry Pi is connected to the projector using RCA cable to the composite in pin on the projector and from video out pin of the Raspberry Pi. Audio jack is also connected from Pi to projector using 3.5 mm cable. The SD card will be formatted using SD formatterv4 application. The SD card is inserted in the Pi. The Pi is given power supply of 700mA and 5V output adapter. The USB Wi-Fi adapter is connected to the Pi to one of the USB's of the Raspberry Pi. The Raspbian OS can also be operated using a mouse by connecting to the USB of the Raspberry Pi. A network is created with a suitable name using connectify-me application. The laptop is connected to the network created by the connectify-me. VNC server is started on the laptop. Then the VNC viewer is auto-booted in the Raspberry pi, so whenever the Raspberry pi is switched on the VNC viewer also gets started. The VNC viewer application is given the details of the IP address and Port number of the laptop in advance. So once the Raspberry pi is started the laptop screen comes to the projector.

V. RESULT

The proposed system can replace the laptop with Raspberry Pi. So the system cost will be reduced. The system requires only 5V power supply so it is cost effective as well as power consuming system. Also system can be remotely controlled using mobile as well as laptop that gives us best solution. Due to use of mobile and laptop, controlling can be done from anywhere when the Raspberry pi and mobile/laptop connected to the same network. So there is no need to stand near the projector. It's beneficial in classroom and conference. The system is user friendly. Also system use VNC application which is readily available on play store as well as it is available for different operating systems. On the system we can show all presentation, PDF and word file. The entire system is very useful and gives best solution of the problem.

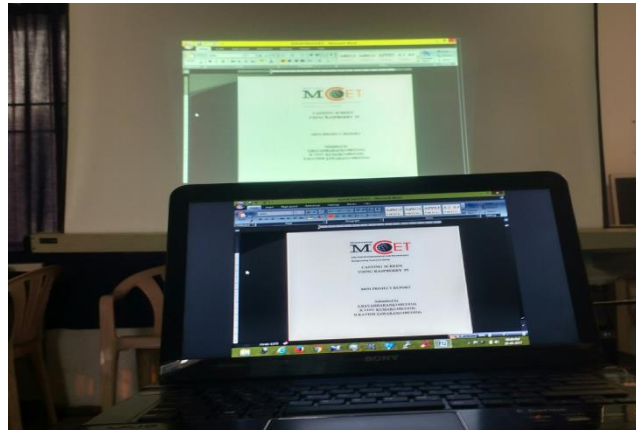


Figure 3. Output of the Project

VI. CONCLUSION

In this project the proposed idea wifi casting via Raspberry pi has been developed. The developed prototype has successfully established communication between Laptop and projector via Raspberry pi. The development process included linux commands which helps in inter device communication which is the core objective of the project. This technology is primitive and it can be extended to many devices like CCTV surveillance in remote areas ,portability with handheld devices. The future completely relies on IOT devices and this technology will perish due to its user interactivity and portability.

REFERENCES

- [1] www.raspberrypi.org.in
- [2] Membrey, Peter, and David Hows. Learn Raspberry Pi with Linux. Apress, 2012
- [3] Upton, Eben, and Gareth Halfacree. Raspberry Pi User Guide. John Wiley & Sons, 2012
- [4] DhavalChheda, DivyeshDarde, Shradha Chitalia,“Smart Projectors using Remote Controlled Raspberry Pi”International Journal of Computer Applications (0975 – 8887) Volume 82 – No. 16, November 2013.